

### 3.2 Panel 5: Government Support to Industry

#### 3.2.1 Panel Chairs:

Ron Loose – U.S. Department of Energy (DOE), Washington D.C.

Maurice Kaya - State of Hawaii Department of Business, Economic  
Development and Tourism (DBEDT)

*Presentation charts follow*









# The Wind Energy Systems Program

- Accelerating Commercialization
- Promoting Economic Development
- Enhancing the Environment
- Ensuring Technical Competitiveness

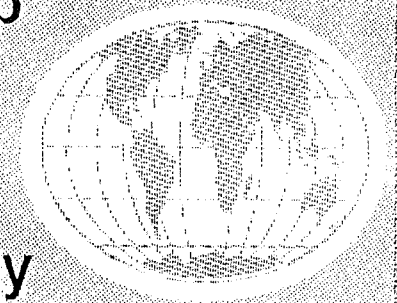
Ronald R. Loose, Director  
Wind Energy Program, U.S. Department of Energy



# Program Objectives

- Increase utility use of wind energy
- Develop advanced wind turbines
- Increase productivity and industry competitiveness
- Upgrade the applied research base

World  
leadership  
in wind  
turbine  
technology  
markets





# Program Strategy

**"Collaborate with key stakeholders to accelerate the widespread development and commercialization of wind technology, while achieving national objectives including increased economic development and reduced greenhouse gas emissions."**



# Recent Program Accomplishments

- Advanced wind turbines for the near-term market under development and test

- Utility Wind Turbine Verification Program is establishing utility confidence in advanced technology

- Next generation innovative subsystems development initiated

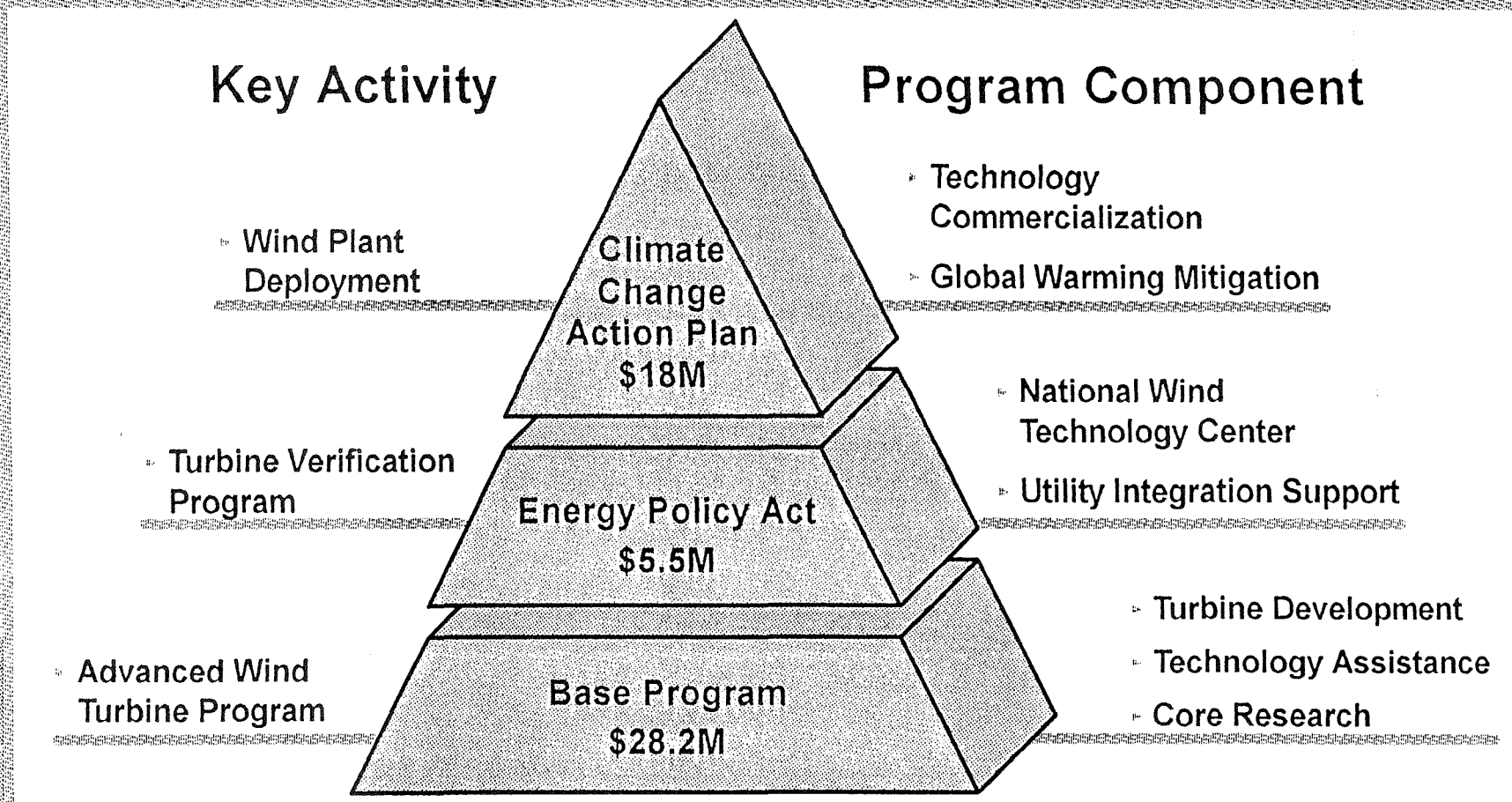


# **FY 94/95 Plans**

- **Establish National Wind Technology Center**
- **Initiate full-scale next generation turbine development**
- **Establish a Market Mobilization Collaborative**
- **Continue ongoing core research activities**



# FY95 Wind Energy Program



Wind Energy Systems

U.S. Department of Energy



# Collaborative Role

- Provide a forum for key stakeholder viewpoints on a market-driven, coordinated approach to accelerate the use of wind power
- Develop consensus on Collaborative activities that will stimulate follow-through by natural market forces
- Coordinate implementation of activities

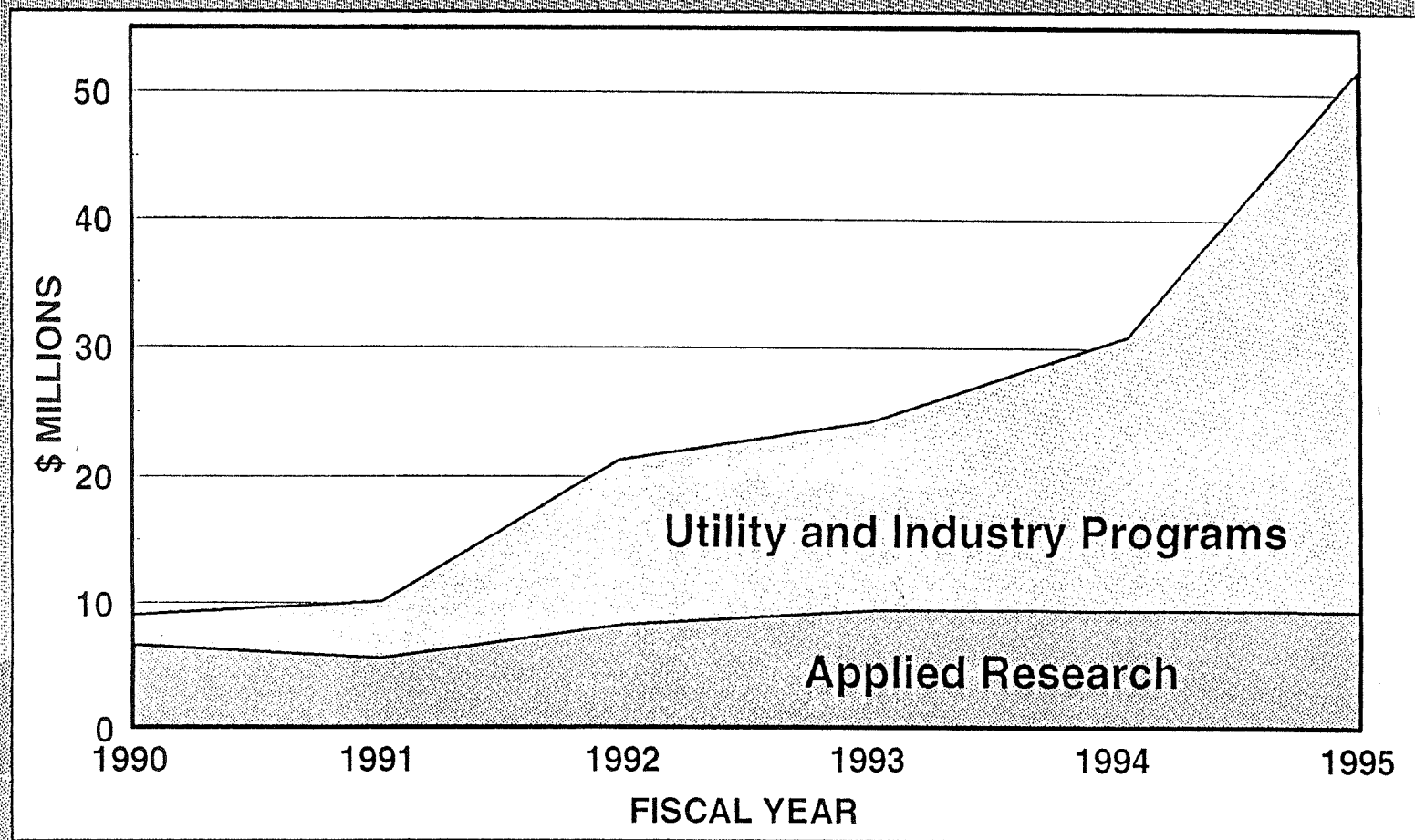


# **Program Actions in Support of the Climate Change Action Plan**

- **Initiate windfarm deployment projects**
- **Expand the Turbine Verification Program**
- **Initiate avian research**
- **Initiate a Utility Wind Resource Assessment Program**



# Budget Perspective



Wind Energy Systems

U.S. Department of Energy



# Summary

- Program advancing on target
- Large wind resource exists
- Sizable markets emerging
- Technology continues to mature
- Utility interest expanding
- Next generation wind turbine development underway
- Commercial windfarm deployment projects underway

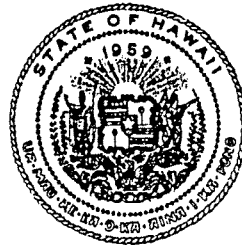


**STATE OF HAWAII  
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
ENERGY DIVISION**

***PANEL 5***

***"GOVERNMENT SUPPORT TO INDUSTRY"***

***The Hawaii Windpower Workshop  
March 21 - 22, 1994***





## **STATE AND LOCAL GOVERNMENT SUPPORT**

- DEVELOP ACCURATE RESOURCE DATA BASE
- OVERCOME TECHNICAL BARRIERS
- OVERCOME INSTITUTIONAL BARRIERS
- PROVIDE APPROPRIATE FINANCIAL INCENTIVES



## **DEVELOP ACCURATE RESOURCE DATA BASE**

- HAWAII ENERGY STRATEGY
  - Assess Previous Resource Assessments
  - Collect, Publish Detailed Site Specific Data
  - Develop Resource Supply Curves
- INTEGRATED RESOURCE PLANNING
  - Ensure Supply-Side Plan Fairly Depicts Renewables



## **OVERCOME TECHNICAL BARRIERS**

- PARTNERING WITH DOE AND INDUSTRY
- ADDRESS LIMITATIONS OF OLD TECHNOLOGY
- ADDRESS STORAGE, GRID INTEGRATION PROBLEMS
- DEMONSTRATE ADVANCED WIND TURBINES
- DEVELOP A PACIFIC WIND TURBINE





## **PROJECT DEVELOPMENT EXAMPLES**

- KAHUA RANCH WIND-PUMPED HYDRO
- KAHUKU ZUTECK ROTOR PROJECT
- MOLOKAI WIND-DIESEL HYBRID PROGRAM



## **OVERCOME INSTITUTIONAL BARRIERS**

- INTEGRATED RESOURCE PLANNING
  - Supply-Side Resource Plans
  - Wind Energy Acquisition Plan
  - Total Fuel Cycle Costing Analysis
- FACILITATE PERMITTING
  - Advocacy
  - Streamlining





## **PROVIDE APPROPRIATE FINANCIAL INCENTIVES**

- STATE TAX CREDITS
- FEDERAL PRODUCTION INCENTIVE CREDIT
- OTHERS, ADDERS, EXTERNALITIES







### 3.2.2 Panel Members:

**Lawrence Mott - Northern Power Systems**

**Mike Boughton - Maui Economic Development Board**

**David Rezachek - State of Hawaii DBEDT**

### Panel Responses

*David Rezachek – State of Hawaii DBEDT*

Dr. Rezachek outlined areas in which state government can provide support to renewable energy development in Hawaii. Given the limited funds, we need to leverage these funds with funds from other state and federal agencies as well as the county and the private sector in order to develop projects.

In furthering the development of renewable energy in Hawaii, state government can:

- conduct preliminary technical and economic feasibility studies in various areas of renewable energy;
- participate in cost sharing and risk sharing of promising renewable energy R&D and demonstration projects such as the Molokai Wind Diesel Hybrid Project and the Hawaii Zuteck Rotor Project; and,
- investigate other areas of technology to further the use and penetration of wind into the utility grid here in Hawaii including:
  - hybrid systems to increase the availability of wind through the use of a backup generator such as a diesel generator,
  - storage systems to increase the availability of wind through pumped hydro or battery systems.

Projects of these types are being developed at the Renewable Energy Storage Test Facility on the Big Island. The state government's principle interest in this type of technology, Dr. Rezachek explained, is to develop a control strategy to learn how to control other larger scale projects in a similar manner.

He outlined other approaches state government can take to further the development of renewable energy:

- make land available to developers for renewable energy projects,
- conduct statewide renewable energy assessments for a variety of renewable energy technologies, and



- facilitate the permitting process for renewable energy projects. In some cases, it has been determined that over 100 permits are needed to develop a project. In Hawaii, where projects are developed on a smaller scale than on the mainland, the permitting process represents a much higher cost of the total development of the project. Since many of the permits ask the same questions, opportunities arise to process some of these permits at the same time.

Permit facilitation is advantageous not only to the developer but to the public as well, Dr. Rezachek pointed out. Many of the environmental and public activist groups do not always have the resources to devote to a lengthy permitting process. By reducing the amount of resources that need to be devoted to permitting, it can actually increase the public's ability to participate and thus be a benefit to both groups.

In addition, state government can also:

- support various economic incentives for renewable energy development on both the residential scale as well as the utility scale particularly in isolated communities and remote areas;
- provide information to the PUC and the general public on renewable energy systems by serving as a secondary source of information; [State government can review the evaluations and analyses of utility studies conducted by other groups to ensure that they properly reflect accurate cost and performance figures as well as the status of the technology.]
- coordinate and assist in the coordination of efforts to various government and private agencies to avoid overlap and lack of coordination which causes fewer projects to be developed and money to be wasted;
- solicit public participation in policy making and incorporate some of that input into policy. [If developers solicit public participation early on in their project by addressing the public's concerns and soliciting public support, it will make the efforts easier, Dr. Rezachek said in referencing Mr. Avery's remarks in panel 3.1. The same argument also holds true for policy making.]
- develop legislative initiatives to implement policy and accelerate renewable energy development. [A direct result of the crisis in the sugar industry could be the conversion of biomass generated power plants to fossil fuel, illustrating the need for policy initiatives to stimulate renewable energy development, he said.]



Dr. Rezachek acknowledged state government's active role in the area of policy and planning in promoting renewable energy development and detailed some of these efforts:

- In 1989, the state held a workshop on enhancing renewable energy development in Hawaii. This was a public forum to determine where the impediments to renewable energy technology development are and how to overcome them.

Followed by:

- Hawaii Integration Energy Policy discussion and programs,
- Hawaii Energy Strategy and more recently,
- the Integrated Resource Planning (IRP) process.

In addition, last year the state held the *Energy and Environmental Summit* which brought together over 600 representatives of various energy and environmental groups to develop a consensus of what types of things can be done in the short term to enhance the renewable energy development and address the environmental concerns of the general public.

As a result of this summit, eight pieces of legislation were generated that focus on the acceptance of renewable energy in Hawaii. Dr. Rezachek detailed each legislative bill separately:

- A production incentive of 1½¢ per kWh for all renewables which would be financed by a surcharge on utility bills [According Dr. Rezachek's analysis if Hawaii increased it's use of renewable for fuel consumption from the current level of 10% to a level of 20% by the year 2014, a production incentive would increase utility rates by 1½% or an additional \$1.00 per month for the average utility rate payer.]
- Net billing system to provide for an exchange of kW hours rather than the current system whereby you have to pay the retail cost for electricity used while you are paid at the avoided cost rate
- 75 day rule that allows independent power producers the opportunity to keep the negotiation process moving for avoided cost contracts
- HRS Chapter 226, A Permit Process Facilitation Act, incorporates externality concerns
- A 35% income tax credit for residential wind and PV systems which is an improvement on current residential income tax credits
- Nonutility generator guidelines for the utility requiring PUC approval
- Legislation to ensure that PV/Solar contractors can do all of the work (including electrical) on residential solar water heating systems



- Establishment of a Hawaii Energy Commission.

Most of these bills did not go very far during this year's legislative session primarily because of the lack of available funding resources this year, Dr. Rezachek explained. However, we hope to can keep this process going by taking some of the key issues out of some of these bills that did not make it and reintroducing them as concurrent resolutions in next year's legislative session. This will require the effort and cooperation of the various agencies and special interest organizations to look at how they can facilitate the implementation of these bills some of which require more money while others have unanswered questions that need to be worked out.

There are a number of things that state government can do, and workshop participants can do as well, to assist in this effort to keep the process going for the next legislative session, Dr. Rezachek said in closing.

#### *Mike Boughton - Maui Economic Development Board*

As a representative of the Planning and Economic Development Board for Maui County, Mr. Boughton stated his primary interest lies in the economic diversification of Maui.

"I have always believed in renewable energy, in all of its forms, as a natural form of economic diversification for this state because of the push/pull effect -- we need the alternative energy and we have a lot of resources," he said.

To summarize what government can do for the development of renewable energy, Mr. Boughton provided an outline of general functions of government:

- Provide technical information through R&D and demonstration programs as well as legal information to give a better understanding of the various processes such as permitting
- Set supportive procedures by putting competent individuals in the various processes
- Sense the public sentiment and lead it. Good state leadership can turn sentiment into action

Mr. Boughton observed that all of the workshop participants believed in the team effort approach with some sobering cautions.

"Various team members spoke of their willingness to play the game. I believe that an important function of government is to bring the team together. The objective of government should be to develop a legal and



"Various team members spoke of their willingness to play the game. I believe that an important function of government is to bring the team together. The objective of government should be to develop a legal and regulatory environment to allow and induce the team members to play together," he contended.

On the subject of financial matters, Mr. Boughton perceives there is still an apparent need for government subsidies in Hawaii.

"It is clear to investor owned utilities, particularly those in a regulatory environment, that any kind of direct subsidy is going to make a great deal of difference to speed up the projects and overcome conservative thinking that is a natural tendency, especially in Hawaii where conservatism is even more important because the consequences of a mistake is even more serious than in a non-grid situation," he said.

A secondary role that government can play in helping to develop renewable energy, particularly wind, Mr. Boughton noted, is in fostering an attitude that is supportive and stimulating of technology based industry. Funding for demonstration and R&D projects in collaboration with industry will go along way towards this goal, he said.

At the same time, government needs to view the Alternative Energy Development Program as a long term project, he emphasized in referencing his work with the Renewable Energy First National Plan for Energy Research Development Demonstration in 1974.

"The predictions made at that time, as to how rapidly renewable energy would develop, were optimistic primarily because of the assumption that oil would be priced at \$100 a barrel by now," he said clearly illustrating how the planning process can be effected by the assumptions that are made.

And finally, education is an important function of the government's renewable energy development program. It is a generation long program. If we are to effect the transfer of information about alternative energy, education has to start in the first grade. More education of renewable energy needs to be carried out in the primary, secondary and high schools, he said in closing.

#### *Lawrence Mott - Northern Power Systems*

Representing the manufacturers perspective, Mr. Mott outlined the impact of government on helping to move technology forward. He illustrated this through examples of projects that government has impacted.



- A cost-shared program with SERI (now NREL) in the late-1970s with the U.S. Navy to develop a wind-turbine project. SERI/U.S. DOE gave Northern Power Systems, a relatively unknown small business, the credibility with the Navy to establish a successful project. The wind turbine is now a commercial machine and is installed internationally and works quite well, he added.
- Turbulence studies on 100 kW turbines were undertaken in the mid-1980s to understand the forces on rotors. Government funding and expertise were still needed to help move this technology forward.
- In Palm Springs today, turbines have been installed and are being tested as part of the Advanced Turbine Program using past experience with government and industry as a technical engineering group to move technology forward.
- Wind/PV hybrid systems for village power systems are packaged for off-grid situations to keep village economies going, Mr. Mott said in referencing a fishing village on the Big Island in need of a refrigeration and power generation system. This is an important example of the need to bring appropriate technology in while the market is not mature enough.

Such partnerships with government are an attraction to other team players as well, Mr. Mott added, "As a result of a village power system project developed in Alaska, we gained a utility partner as well as a large diesel manufacturer that signed on when they found out we had government support."

Government support for commercialization is needed in order for small companies to attract other team members through demonstration projects, he said in closing.